

IN THE CLAIMS

1 1. (Currently amended) An antenna structure comprising:

2

3 at least one antenna element, the at least one antenna element having at

4 least one taper; and

5

6 a symmetrical finite ground plane coupled with the at least one antenna

7 element.

1 2. (Original) The antenna structure of Claim 1, wherein the at least one

2 antenna element comprises a travelling wave antenna supporting a phase

3 velocity greater than the speed of light.

1 3. (Original) The antenna structure of Claim 1, wherein the taper comprises a

2 linear profile, a linear constant profile, a broken-linear profile, an exponential

3 profile, an exponential constant profile, a tangential profile, a step-constant

4 profile, or a parabolic profile.

1 4. (Original) The antenna structure of Claim 1, wherein the antenna structure

2 supports a cigar-like directional three-dimensional beam pattern and a butterfly

3 wing-like directional three-dimensional beam pattern.

1 5. (Original) The antenna structure of Claim 1, wherein the at least one

2 antenna element is positioned at an angle from the symmetrical ground plane.

1 6. (Currently amended) The antenna structure of Claim 5, wherein the angle
2 is about 90 degrees with respect to the x-, y- and z- axes.

1 7. (Original) The antenna structure of Claim 1, wherein the at least one
2 antenna element is coupled with the symmetrical ground plane by means of an
3 unbalanced impedance.

1 8. (Original) The antenna structure of Claim 7, wherein the unbalanced
2 impedance comprises a coaxial cable.

1 9. (Original) The antenna structure of Claim 7, wherein a first conductor of
2 the unbalanced impedance mechanically couples the at least one antenna
3 element with the symmetrical ground plane.

1 10. (Original) The antenna structure of Claim 1, wherein the symmetrical
2 ground plane is disk shaped.

1 11. (Currently Amended) An antenna structure comprising:
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3 an array of at least two antenna elements, each antenna element having at
4 least one taper;
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6 a symmetrical finite ground plane; and
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8 an unbalanced impedance for coupling the array of at least two antenna
9 elements with the symmetrical ground plane.

1 12. (Original) The antenna structure of Claim 11, wherein at least one antenna
2 element of the array comprises a travelling wave antenna supporting a phase
3 velocity greater than the speed of light.

1 13. (Original) The antenna structure of Claim 11, wherein the taper of at least
2 one antenna element of the array comprises a linear profile, a linear constant
3 profile, a broken-linear profile, an exponential profile, an exponential constant
4 profile, a tangential profile, a step-constant profile, or a parabolic profile.

1 14. (Original) The antenna structure of Claim 11, wherein each antenna
2 element of the array supports a cigar-like directional three-dimensional beam
3 pattern and a butterfly wing-like directional three-dimensional beam pattern.

1 15. (Original) The antenna structure of Claim 11, wherein each antenna
2 element of the array is positioned at an angle from the symmetrical ground
3 plane.

1 16. (Currently amended) The antenna structure of Claim 15, wherein the
2 angle for each antenna element is about 90 degrees with respect to the x-, y- and
3 z- axes.

1 17. (Original) The antenna structure of Claim 11, wherein the unbalanced
2 impedance comprises a coaxial cable.

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1 18. (Original) The antenna structure of Claim 17, wherein a first conductor of
2 the unbalanced impedance mechanically couples each antenna element of the
3 array with the symmetrical ground plane.

1 19. (Original) The antenna structure of Claim 11, wherein the symmetrical
2 ground plane is disk shaped.

1 21. (Currently Amended) An apparatus comprising:

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3 a transceiver; and

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5 an antenna structure for radiating or capturing electromagnetic energy
6 from or to the transceiver comprising:

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8 at least one antenna element having at least one taper, the taper
9 comprising a linear profile, a linear constant profile, a broken-linear
10 profile, an exponential profile, an exponential constant profile, a
11 tangential profile, a step-constant profile, or a parabolic profile;

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13 a symmetrical disk shaped finite ground plane, the at least one
14 antenna element being positioned at an angle from the symmetrical
15 disk shaped finite ground plane; and
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17 an unbalanced impedance for coupling the at least one antenna
18 element with the symmetrical disk shaped finite ground plane.

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1 22. (Original) The apparatus of Claim 21, wherein the at least one antenna
2 element supports a cigar-like directional three-dimensional beam pattern and a
3 butterfly wing-like directional three-dimensional beam pattern.

1 23. (Currently amended) The antenna structure of Claim 21, wherein the
2 angle is about 90 degrees with respect to the x-, y- and z- axes.

1 24. (Original) The antenna structure of Claim 21, wherein the unbalanced
2 impedance comprises a coaxial cable.

1 25. (Original) The antenna structure of Claim 21, wherein a first conductor of
2 the unbalanced impedance mechanically couples the at least one antenna
3 element with the symmetrical ground plane.